Stoller
Hanford Office

DOE-EM/GJ1216-2006

299-E28-84 (A6835)
Log Data Report

Borehole Information:

Borehole: 299-E28-84 (A6835)			**Site:** 216-B-62 Crib		
Coordinates (WA St Plane)		**GWL[1] (ft) :** None		**GWL Date:**	12/12/05
North	**East**	**Drill Date**	**Elevation (ft) (TOC)**	**Total Depth (ft)**	**Type**
136767.367	573116.113	06/83	682.1	80	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded steel	2.65	8 5/8	8	5/16	2.65	80

Borehole Notes:

Casing diameter and stickup measurements were acquired using a caliper and steel tape. Logging data acquisition is referenced to the top of casing (TOC). Grout was emplaced around the 8-in. casing to 20 ft.

Spectral Gamma Logging System (SGLS) Equipment Information:

Logging System: Gamma 1N		**Type:** SGLS (60%) SN: 45-TP22010A
Effective Calibration Date: 11/29/05	**Calibration Reference:**	DOE/EM-GJ1053-2005
	Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0

High Rate Logging System (HRLS) Equipment Information:

Logging System: Gamma 1C		**Type:** HRLS SN: 39-A314
Effective Calibration Date: 10/06/05	**Calibration Reference:**	DOE/EM-GJ1019-2005
	Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	3	4 Repeat	
Date	12/19/05	12/19/05	12/19/05	12/19/05	
Logging Engineer	Spatz	Spatz	Spatz	Spatz	
Start Depth (ft)	80.0	54.0	30.0	19.0	
Finish Depth (ft)	53.0	30.0	3.0	9.0	
Count Time (sec)	100	20	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	

Log Run	1	2	3	4 Repeat	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
ft/min	N/A[2]	N/A	N/A	N/A	
Pre-Verification	AN003CAB	AN003CAB	AN003CAB	AN003CAB	
Start File	AN003000	AN003028	AN003053	AN003081	
Finish File	AN003027	AN003052	AN003080	AN003091	
Post-Verification	AN004CAA	AN004CAA	AN004CAA	AN004CAA	
Depth Return Error (in.)	N/A	N/A	N/A	0.0	
Comments	No fine-gain adjustment	High-rate interval	No fine-gain adjustment	Repeat section	

High Rate Logging System (HRLS) Log Run Information:

Log Run	5	6 Repeat			
Date	12/27/05	12/27/05			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	63.0	36.0			
Finish Depth (ft)	30.0	33.0			
Count Time (sec)	300	300			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	NA	NA			
Pre-Verification	AC155CAB	AC155CAB			
Start File	AC156000	AC156034			
Finish File	AC156033	AC156037			
Post-Verification	AC156CAA	AC156CAA			
Depth Return Error (in.)	N/A	- 1.0			
Comments	Adjusted gain before logging began at bottom of borehole.	Repeat section.			

Logging Operation Notes:

Logging was conducted with a centralizer on the sonde for both SGLS and HRLS logging. Repeat sections were collected to evaluate the logging systems' performances.

Analysis Notes:

Analyst:	Pope	Date:	05/31/06	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging systems were performed before and after the day's data acquisition. Acceptance criteria were met, with the exception of the resolution of the 609 keV (^{214}Bi) energy peak for the SGLS pre-survey verification spectrum, which was 0.02 above the upper control limit. The resolution control limits are occasionally exceeded due to, among other things, differences in local environments in which verification spectra are acquired. Log spectra and the post-survey verification spectrum both exhibit good resolution, and therefore the pre-survey verification spectrum is provisionally accepted.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated using the EXCEL worksheet template identified as G1NNov05.xls. A casing correction for 0.3125-in. thick casing was applied to the SGLS data.

Results and Interpretations:

A continuous zone of ^{137}Cs was detected from 18 ft to the bottom of the borehole (80 ft). A zone of high ^{137}Cs concentrations exists from approximately 31 to 63 ft. The maximum concentration is approximately 5,800 pCi/g at 35.0 ft. A second zone of ^{137}Cs exists between 3 and 8 ft, with a maximum concentration of approximately 4 pCi/g at 5 ft. ^{137}Cs was also detected at 13 ft at a concentration just above the MDL[3] (approx. 0.1 pCi/g).

Westinghouse Hanford Company logged this borehole in 1994 with the Radionuclide Logging System (RLS). The ^{137}Cs concentrations determined by the RLS, and decayed to 2005, show good agreement with the current SGLS measurements.

The repeat sections for the SGLS and HRLS indicate good agreement for the naturally occurring and man-made radionuclides.

List of Plots:

Man-Made Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma and Dead Time
SGLS/RLS Man-made Comparison
SGLS/RLS Gross Gamma Comparison
Repeat Section for Man-Made Radionuclides
Repeat Section of Natural Gamma Logs
HRLS Repeat Section

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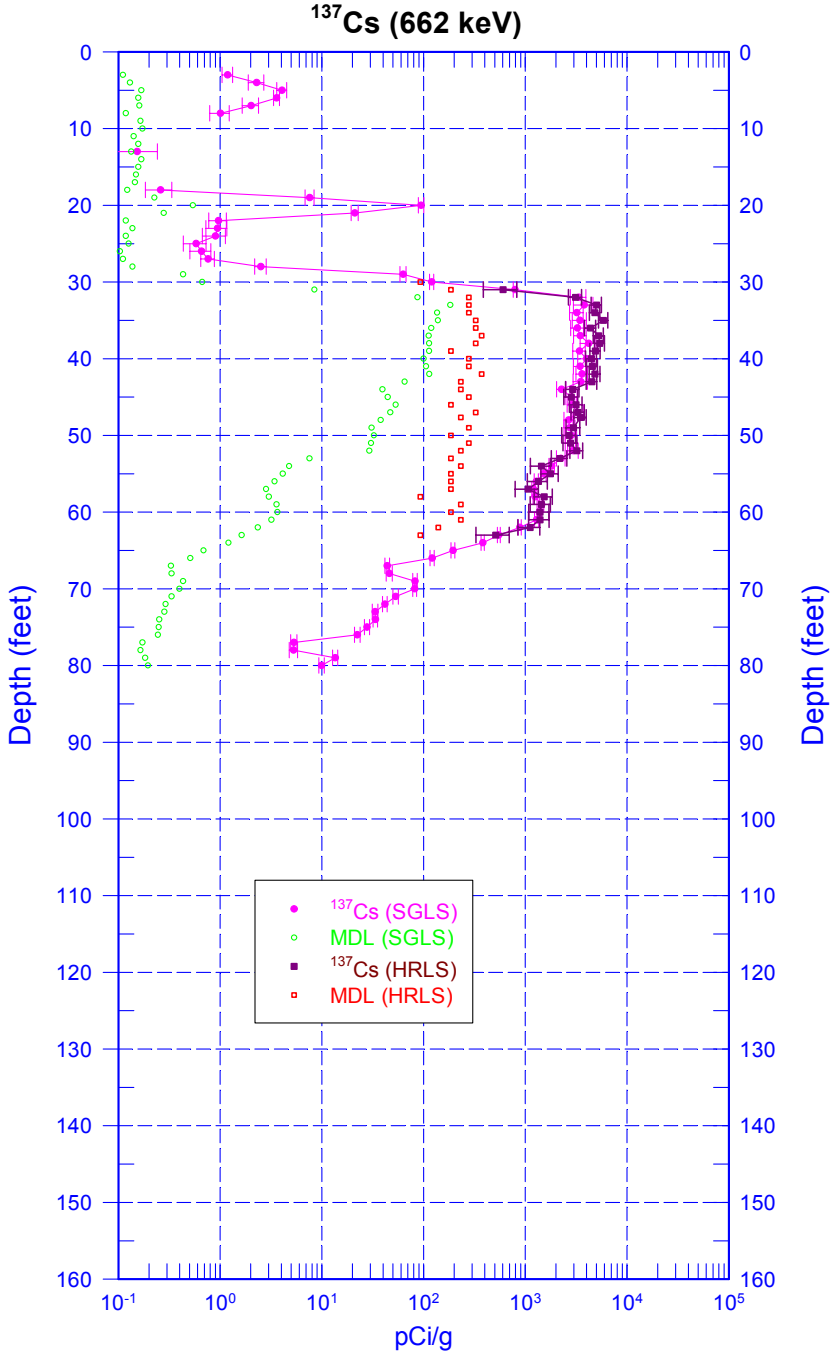
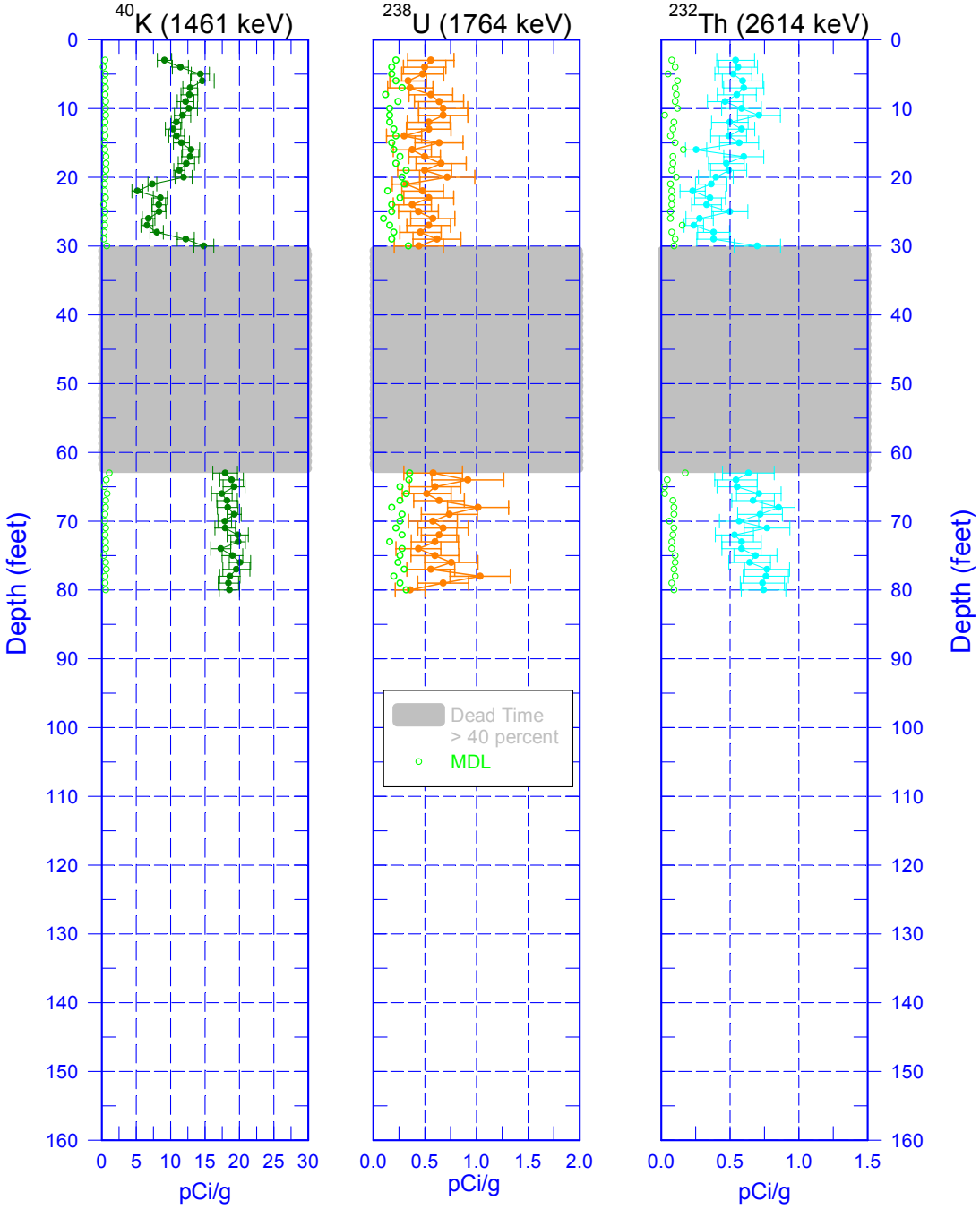
[1] GWL – groundwater level
[2] N/A – not applicable
[3] MDL – minimum detectable level

299-E28-84 (A6835)
Man-Made Radionuclides



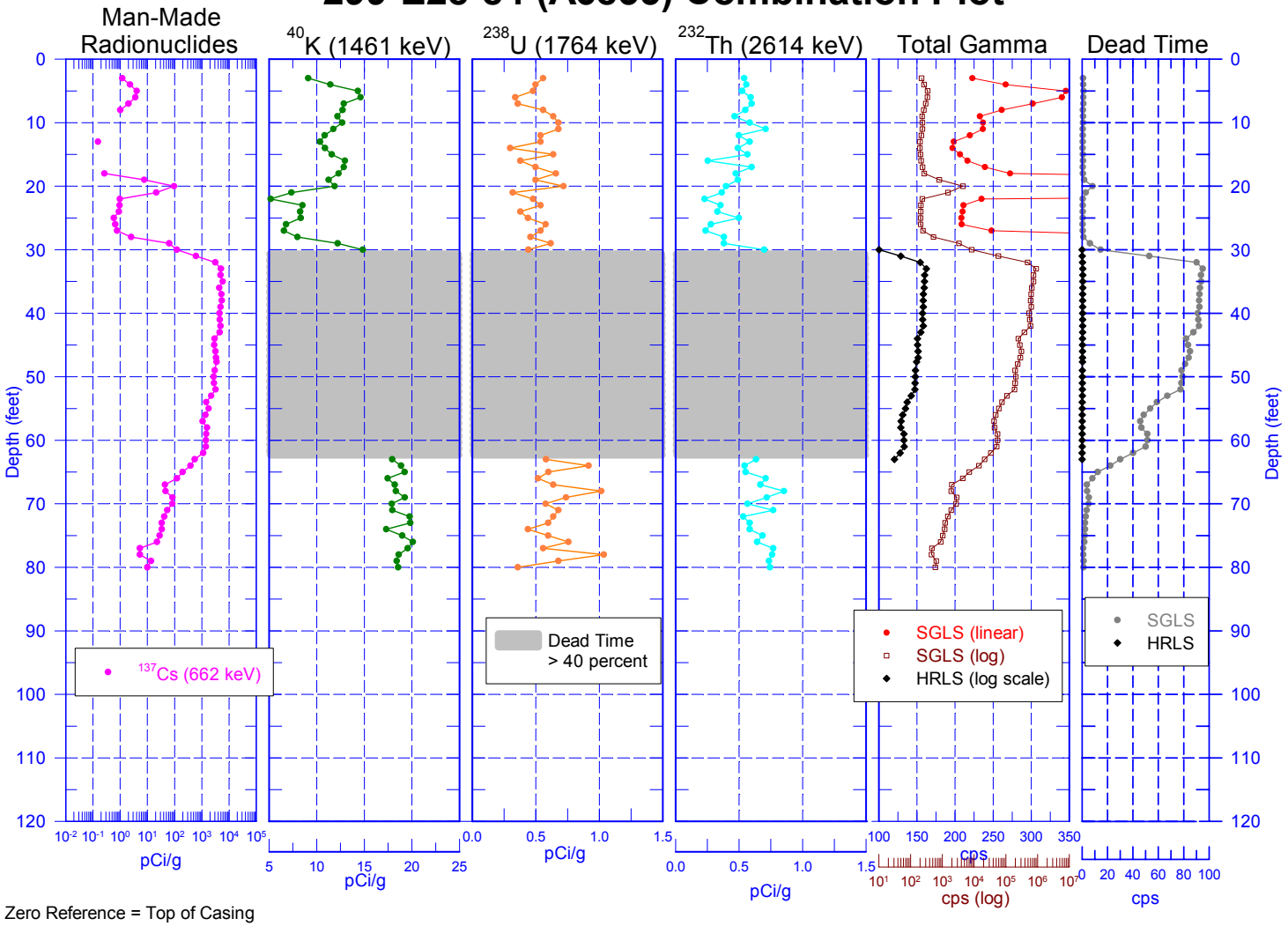
Zero Reference = Top of Casing

299-E28-84 (A6835)
Natural Gamma Logs



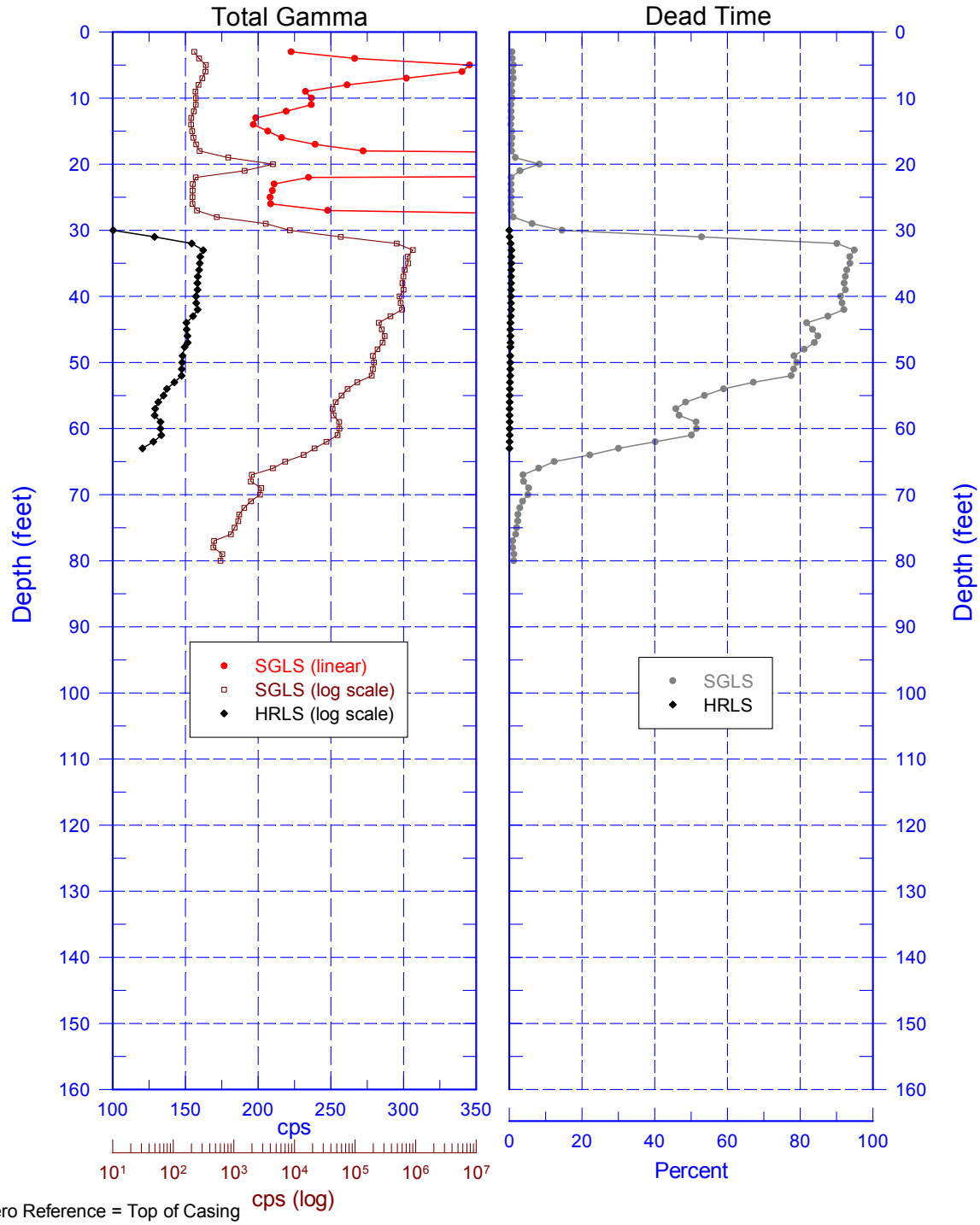
Zero Reference = Top of Casing

299-E28-84 (A6835) Combination Plot



Zero Reference = Top of Casing

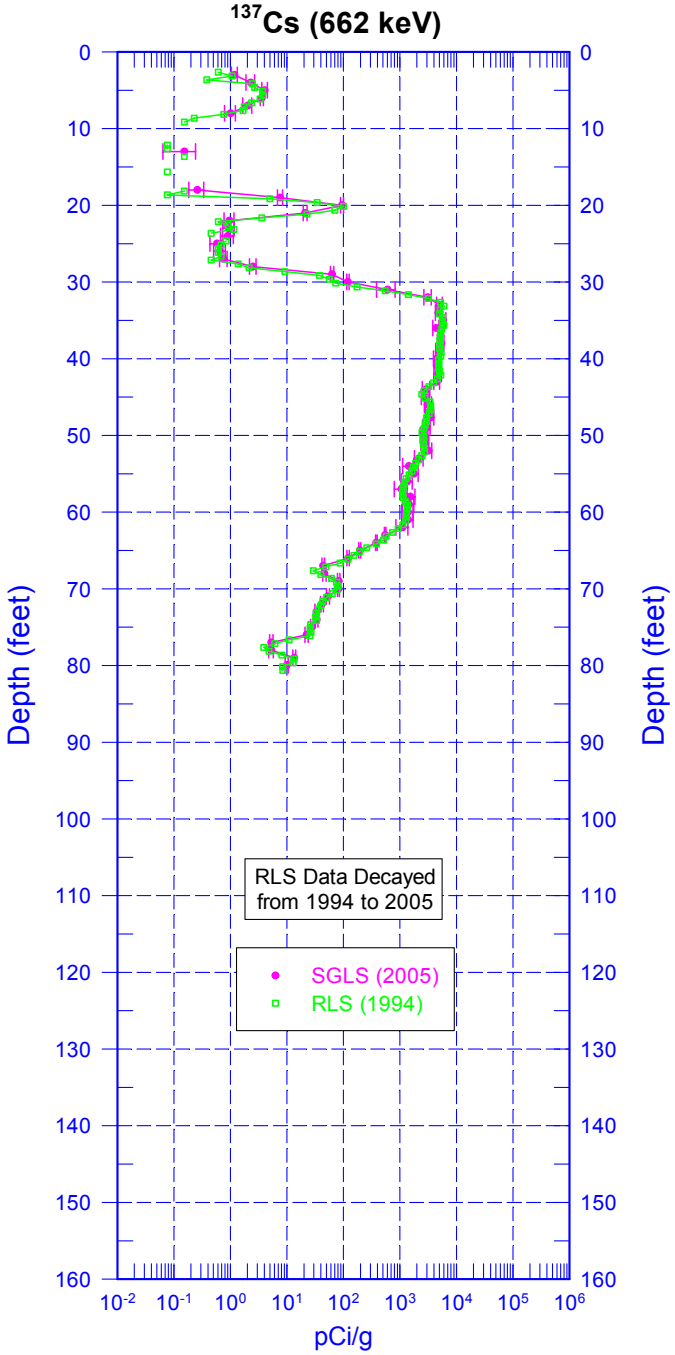
299-E28-84 (A6835)
Total Gamma & Dead Time



Zero Reference = Top of Casing

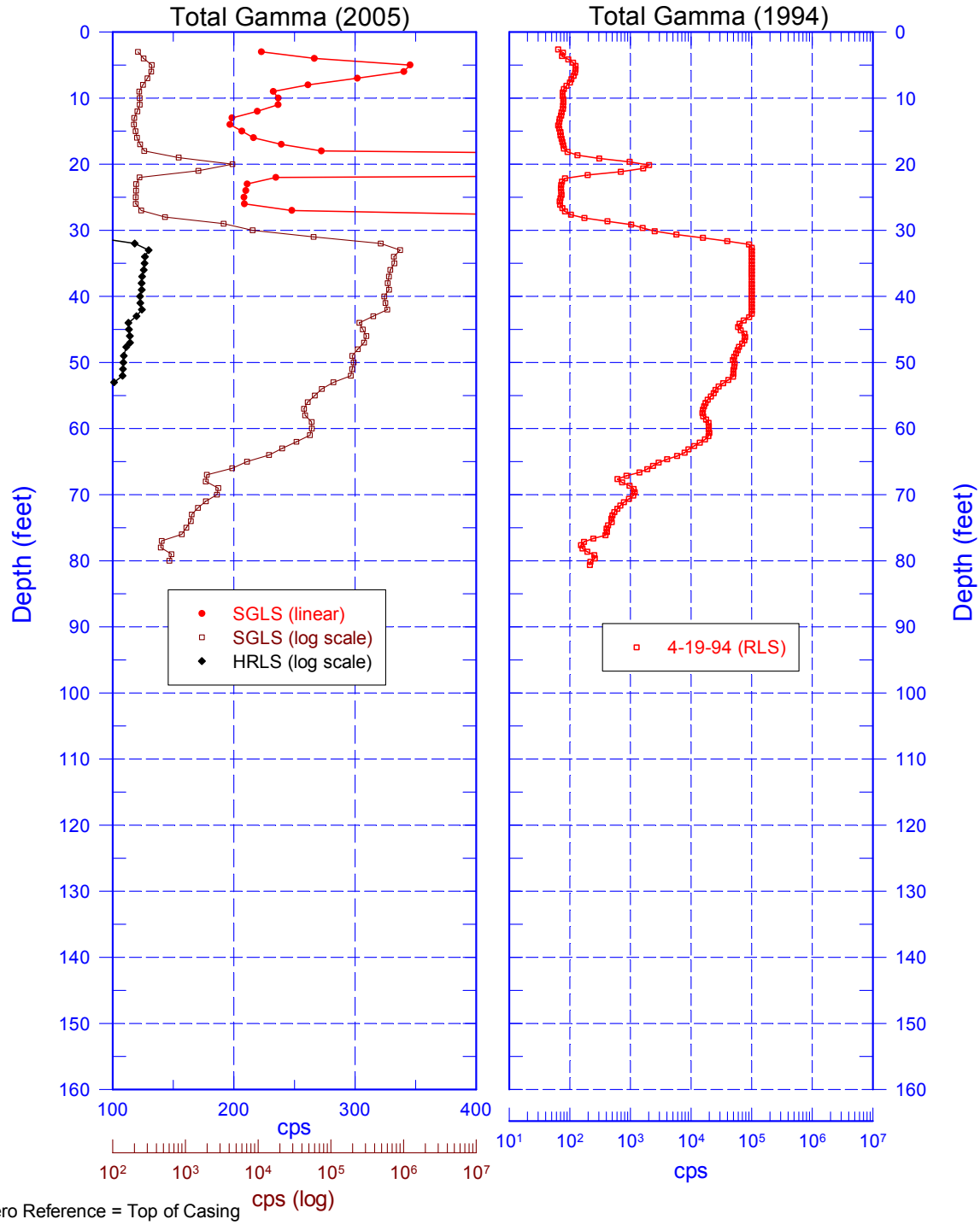
299-E28-84 (A6835)

SGLS & RLS Man-Made Radionuclide Comparison



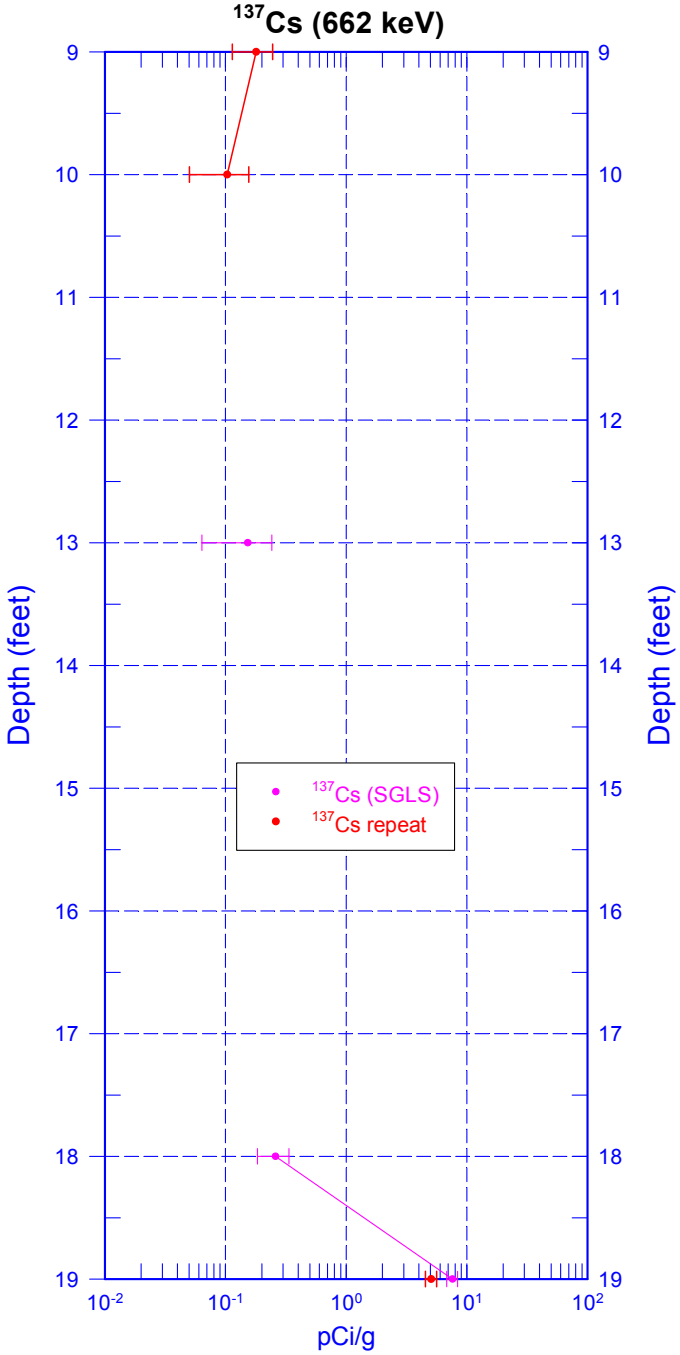
Zero Reference = Top of Casing

299-E28-84 (A6835)
Total Gamma Logs



Zero Reference = Top of Casing

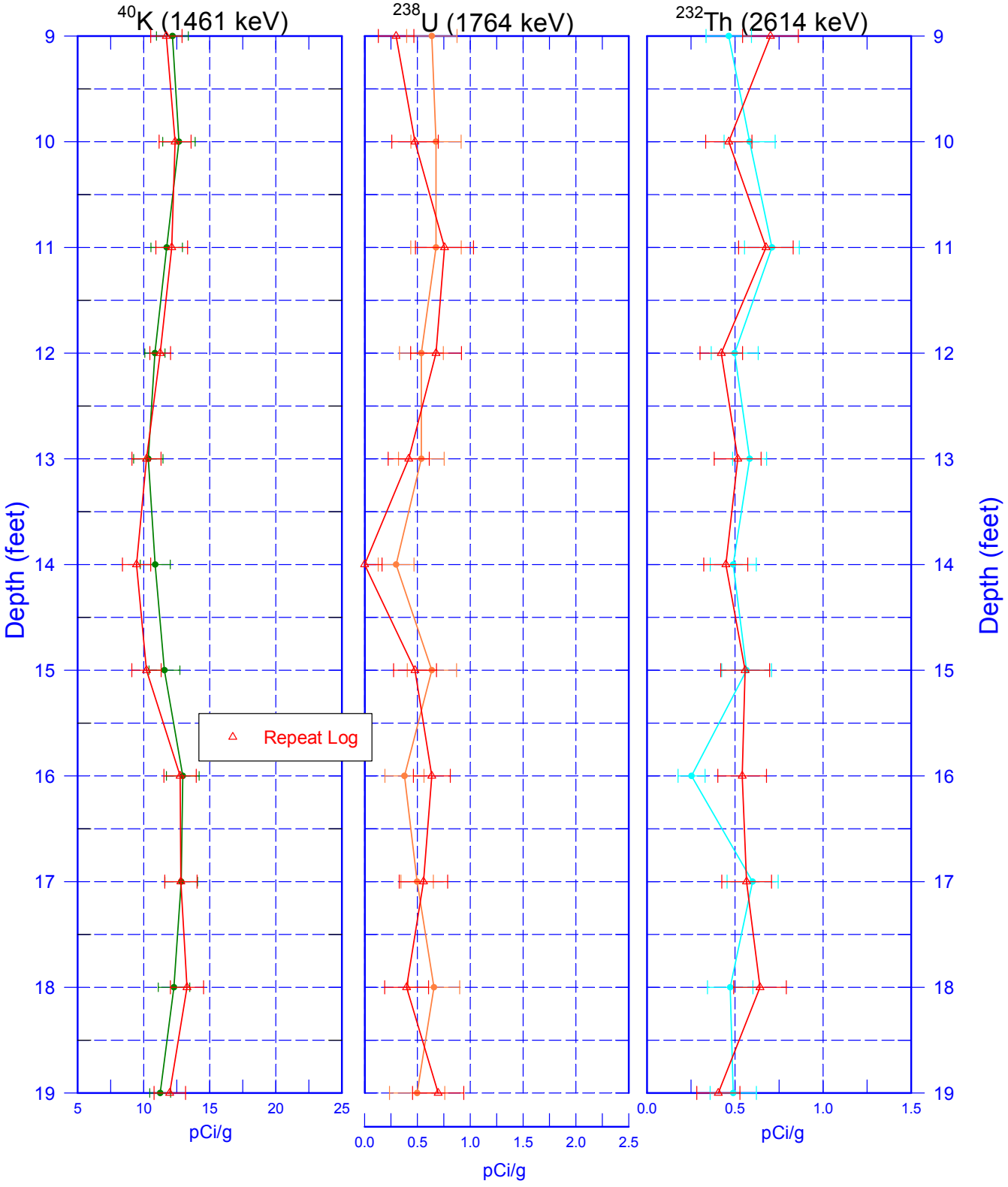
299-E28-84 (A6835)
Repeat Section of Man-Made Radionuclides



Zero Reference = Top of Casing

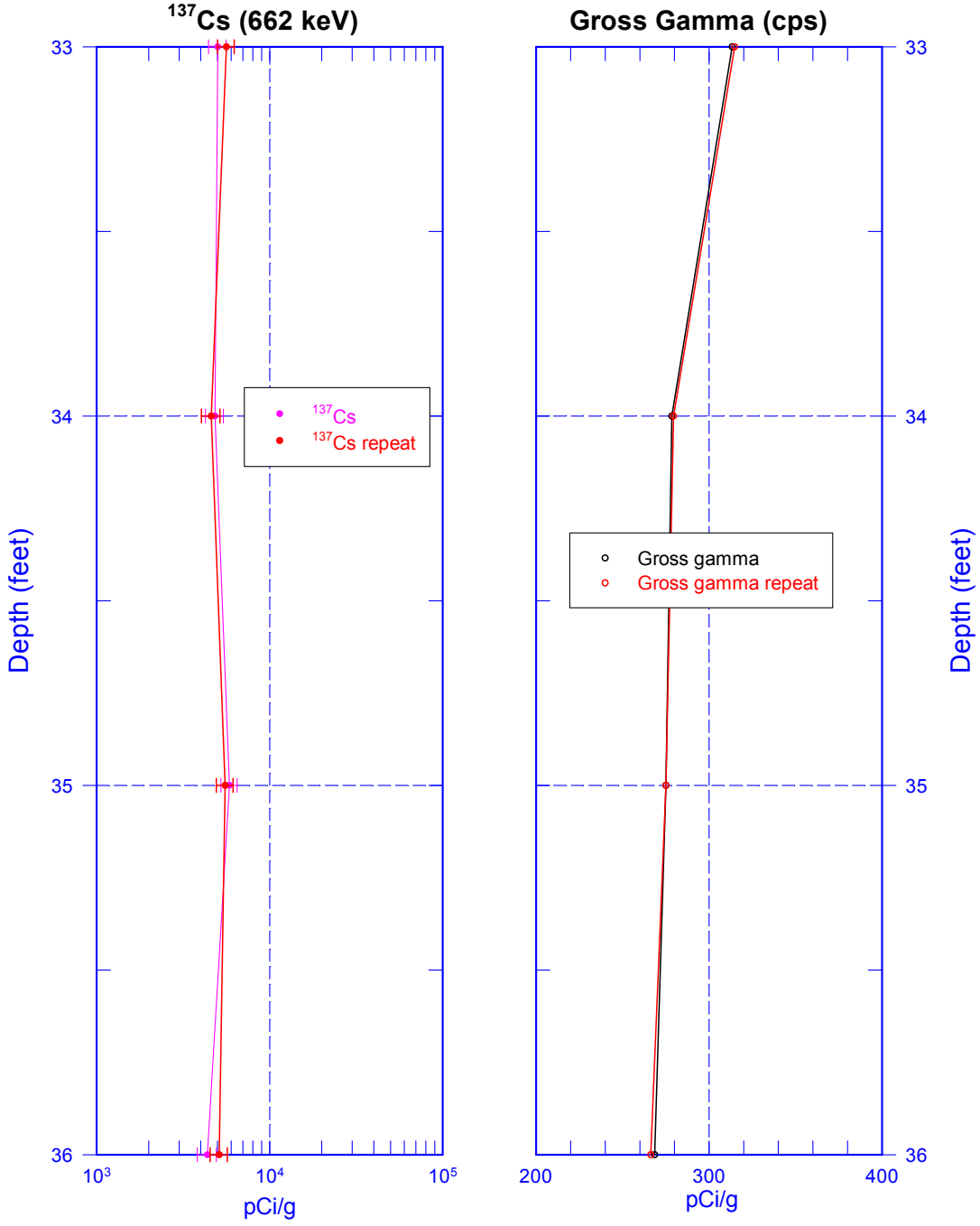
299-E28-84 (A6835)

Repeat Section of Natural Gamma Logs



Zero Reference = Top of Casing

299-E28-84 (A6835)
HRLS Repeat Section



Zero Reference = Top of Casing